



Examiners' Report Principal Examiner Feedback

Summer 2023

Pearson Edexcel GCE
In Design & Technology: Product Design
9DT0/02

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Publications Code 9DT0_02_2306_ER

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Principle Moderators report 9DT02 2023.

Introduction and general comments:

This was the first series post pandemic where the candidates fully sat the examination, and the NEA was completed with little or no mitigations due to the Covid-19 pandemic. We therefore had the 2019 standard as the aim for this series. The assessment criteria were fully utilised as the grid 10 was assessed in the manufacturing element (Quality and Accuracy). The centres for the second year submitted the work on the LWT platform in a digital format. We saw a range of proposals across all of the material areas, Resistant Materials being the most common but also in concept/architectural proposals and a small increase in the number of textiles products but a small decline in electronic products.

In general, the submissions did display the A level demand required and could potentially access all elements of the assessment criteria. That said we still did see some work more suited to lower levels such as GCSE.

In terms of this year's submission, it is clear that the candidates still do not fully understand the iterative design process and they do not adopt a commercial approach to the designing and evaluating phases of the process.

The centres are missing the element of a cyclical/iterative approach that sees the client and/or interested stakeholders at the heart of the proposals with opinions are being sought and having a real effect on the development of the proposal. All too often the work evidenced a client at the beginning often chosen from a 'menu' of three and then feedback in the design phase that lacked a level of reality, the client then re-appeared in the evaluation.

It is important that the candidates try to focus on this aspect as we move the qualification forward, that said where the work was done well this important iterative design principle was very well considered.

Administration (Centres)

A number of centres did not submit authentication forms on the LWT platform this is a regulatory element and so should always be evident. Some centres submitted this in one document in the administration bar this did help in the checking process. We did see some centres that did submit the total marks on the Gateway platform, centres are reminded that the total marks need to be entered on the Gateway whereas the evidence, portfolio, CAB and the authentication should be submitted on the Learner Work Transfer system. We saw less issues with incorrect labelling of files this year centres should be commended for this as they become more familiar with this platform this should continue to improve. However, on occasions we did see some missing photographic evidence this again is required to evidence the manufacturing marks and so should always be included.

Part 1: Identifying and outlining possibilities for design.

Grid 1: Identification and investigation of a design possibility.

The Centre assessment for this grid was generally lenient, the candidates often selected three areas for potential design activity and then added a client to the scenario, this often led to a feeling that the clients lacked a level of reality. In many cases the candidates missed opportunities here in that they had identified an area in which they could look at possibilities with a real client and stakeholders such as boatyards or sports clubs or university study bedrooms, but they then went on to identify other areas of possible design activity. This did dilute the detail in this assessment criteria as the client/stakeholder narrative was somewhat lacking. It is of course feasible that candidates may identify disparate design scenarios and

hone them into a plausible design scenario, but it often detracted from a detailed discussion with clients and users. For example, the boatyard had ample opportunities to have discussions with the users regarding boat handling, and storage or gear storage or indeed the design of the facilities.

In summary many candidates almost chose a solution before involving a client and the investigations often lacked depth and detail.

Grid 2: Investigation of needs and research

In this section we must see a clear plan of action in terms of the research, the needs, wants and values of the client/stakeholders should be established and a perceptive selection of both research sources and a sound linkage between the design needs and the research must be evidenced. In effect the research must have a justification that relates to the design context. In the best case the candidates use the client and stakeholders to good effect maintaining a meaningful dialogue that focused the research and ensured that the information gathered fed into the specification.

However all too often the work lacked focus again because of the lack of the iterative approach, we often saw unfocused rather formulaic research. This research was on occasion templated, centres should avoid this approach especially for the highest marked candidates as it leads to a generic unfocused section and does not allow access to the highest levels of this criterion.

It is imperative that a realistic client narrative steers the research which will then manifest itself in specific, measurable point within the specification.

For example, we should see specific research into the size of the footprint for furniture design for small study bedrooms or pivotal research into the dimensions/quantities of items to be stored. These then would form a measurable specification point.

Candidates must try to avoid generic 'textbook' style research, if it is not necessary to look at softwoods because the client had spoken about the furniture matching the existing surroundings the investigation of softwoods becomes unfocussed and generic.

In summary again the iterative client/stakeholder driven approach is vital if the candidates are to access the highest levels of this criterion, but it also illustrates the linkages between each of the assessment grids.

Grid 3: Specification

This section should be characterised by a fully re-worked design brief that reflects the client's needs and is a product of the investigations that have been undertaken. It should reflect the changes that have been made to the candidates initial thinking, this again evidences the iterative/commercial approach to the design work. The specification should then be realistic, technical and measurable.

The moderation team reported that the submissions in this assessment grid were disappointingly weak for this series.

We did see a number of candidates not offering a re-worked brief which is an essential element of the iterative process i.e., a reaction to the client dialogue and the undertaken research. However often the link between the research and the specification was often rather tenuous, which occasionally vague statements, for example under the heading size candidates offered "large rooms must be big enough to comfortably fit...". These matters should be investigated and firmed up so that the specification can be exactly that, specific!

The specification points could also be too generic, often as a result of materials research or ergonomic and anthropometric research that made little reference to the product or had been the subject of some kind of dialogue with the client or stakeholders.

Where the work was done well the candidates evidenced a real client narrative that focussed the research and then those salient points were picked out in the specifications resulting in a clear measurable methodology that sometimes included a testing schedule.

To summarise this assessment grid the candidates must ensure that the specification points are relevant not generic, focussed on the client and have measurability in the points that would enable testing and an evaluative commentary.

Part 2: Designing a prototype.

Grid 4: Design ideas

This section should be characterised by candidates using a range of design strategies to produce a range of design ideas that are realistic, workable and address the points in the specification criteria from the previous section. Candidates should be thinking like a commercial designer and apply their knowledge of technical skills and materials and back it up with the research they have carried out previously and indeed any additional research that may be required. They must try to be imaginative and draw inspiration for many areas such as nature, industry, design movements and new technology.

The candidates in this grid should be exploring design ideas and detailing sub system designs these should again be consulted on with clients, stakeholders and target markets, this dialogue should trigger further iterations of the designs.

In general, the centre assessments were lenient, we did see some candidates producing only holistic designs with little or no sub assembly designing and very limited technical annotation the client narrative was often omitted. Centres should be aware that this section should be characterised by some detailed designs that move on as a result of research and discussion along with technical knowledge and understanding.

The moderation team reported that in some cases candidates were seen to present design ideas which were often too simplistic for this level and required more part sketches to explain the possible assembly of the design.

To achieve higher levels candidates, need to produce a wide range of designs that address the specification and meet the needs and wants of the user. Designs may change and develop through consultation with the client and by appraising them against the specification. Initial modelling alongside focused and selective research could play a part within this process to show how designs may evolve.

Where this was completed well the candidates did explore possibilities and often revisited after consultations with users, and it was clear that a meaningful dialogue had taken place and the effect was seen on potential proposals. This was well evidenced in the annotation and would allow access to the highest levels of this assessment criterion.

Grid 5: Development of design ideas into a final design.

This section should show that the candidates are drawing on their research, and indeed, in the best cases completing further relevant research in response to the client/end user. This should be evidenced in the annotation that supports the design work. Candidates should use modelling to good effect to test out aspects of the design possibilities which, as a result of the modelling allow the candidates, in conjunction with the interested stakeholders, to develop the prototype further. This of course again would allow the candidates to evidence further iterations of potential solutions.

This section was slightly leniently handled by the centres but is much improved as the centres are using modelling to good effect to test aspects of the proposals. In the best cases the candidate's model and then use these models as visual evidence to promote discussions with the client or stakeholders to trigger further iterations of the proposal. This again evidences the client designer relationship and hence the iterative design process.

Candidates often modelled and tested materials and processes which can be valid, but these tests/models should be justified and inform the design scenario this would probably be evidenced in the accompanying annotation.

Some moderators reported some difficulties in the development section for Architectural models, these submissions must adopt a commercial approach to the development using layout plans and discussions regarding footfall usage and spaces around areas such as tables or serveries etc. The use of finish sampling can also inform discussions regarding aspects of the design, for example.

Where the submission was weaker the candidates offered limited development and little in the way of client interaction or a series of CAD drawings that were really a step-by-step guide to the drawing of the product with no progressive refinement of the product. In some cases, the candidates produced very limited refining such as simple colour changes, this would only allow access to the lowest level in this criterion.

As ever the key to unlocking the higher levels is proven interaction with interested stakeholders that assist in the refining of the product reflecting the needs wants and values of the client.

Grid 6: Final design solution

In this section we are looking for the candidates to be making some final refinements and then presenting a detailed final design solution that enabled third party manufacture to take place. The candidates should then produce a manufacturing specification that details the technical information needed for manufacture. This is often well completed if the candidates produce cutting lists, parts drawings or a tabulated illustration of the operations that need to be undertaken on each part including tools processes etc. Incorporated into this, calculations regarding , for instance strength or avoidance of waste would be evidenced.

This section again is much improved especially in terms of the working drawings where they are less of a product of a CAD package unedited but more a refined and accurate picture of the final proposal. Where candidates often missed opportunities to detail the required evidence it was because they did not use an effective method of communication for example if a sectional view would detail the product or an exploded view then that should be utilised. For example, if the product is sensory garden and has level changes or specific foundation requirements then a sectional elevation probably is the best way to show this allied to smaller parts sections.

Where there were issues it was often in the manufacturing specification element candidates here often did not really produce a manufacturing specification it was rather a description of the process it would be better here to tabulate each part highlighting the materials and processes required to manufacture each part including tolerances and costings/calculations etc. This kind of detail is difficult to evidence in a flow chart for example.

To summarise this section is much improved but to access the very highest levels of the criterion the candidates must evidence complete detail to allow for third party manufacture.

Grid 7: Review of development and final idea.

This section is where the candidates must undertake an intellectual analysis of the work they have undertaken so far, the commentary must be analytical and evaluative it must not be simply descriptive. In the best cases there should be strength and weakness analysis that provides balance and should consider all factors such as materials, processes, techniques and have reference to feedback. The evaluative element must be balanced and ensure that any conclusions undertaken can be supported.

Centres find this criterion the most difficult to access the candidates need to be more analytical and less descriptive, but more importantly the analysis must have some client input and have some balance. This notion of balance was often missing; indeed, the review statements need to have objectivity and a critical commentary. In many cases this was rather more a congratulatory commentary.

Candidates failed to realise that the work in this section must be analytical in nature; it must review the development from client feedback, and the evaluative commentary must have some balance in terms of advantages and disadvantages but more importantly a full dialogue throughout where the client/stakeholders are consulted, and the design moves forward from these discussions.

The balanced evaluative commentary was rarely evidenced, as was the real narrative with the client that mimicked the designer client relationship this is a matter that the centres should address if they are to access the highest levels of the assessment criteria.

In summary this is the weakest criterion in terms of the performance of the candidates as the submission lacks balance, client input and an analytical approach to the review that may influence the final proposal.

Grid Eight: Communication of design ideas

This section splits into three distinct sections in that we should see evidence of more traditional communication techniques along with CAD and real technical detail evidenced in the written communication/supporting annotation.

It is pleasing to report that many candidates met the higher-level descriptors within this grid, in most cases the assessment was broadly in line with the specification criteria. Centres that had access to more advanced CAD programs regularly produced work of a very high standard. The centres should be aware that the awarding of these marks can run throughout the ideas and development sections, and candidates should make use of sketch work, which should be enhanced with a range of techniques including colour to show possible material effects or styles of finish. It is important to remind centres that CAD is not the only way to represent ideation, indeed the spontaneity of some sketches whilst with the client and input from them cannot be underestimated in terms of an iterative approach to the design communication. In the best submissions the annotation was mature and evaluative with real reference to technical elements that reflected the client and illustrated sound knowledge and understanding.

In summary, this section was completed well and assessed well. Submissions rarely had a limited range of communication even at low level responses. However, we are seeing students using fewer sketching skills and the level of technical annotation is on occasion somewhat limited.

Part 3: Making a final prototype.

Grid 9: Tools and equipment

In this section candidates are expected to demonstrate a range of accomplished making skills at and advanced level standard in relation to a sophisticated design problem. The level of demand, range of skills and complexity in the production of a high-quality fully functioning prototype that meets the end user needs and wants but also provides a suitable level of challenge.

Centres need to ensure that the level of skills used in the manufacture optimises the use of tools and equipment at an A level standard.

The manufacturing diary cannot be undervalued in this and the next section it does provide evidence that underpins the centre award, and all centres that submitted this evidence was commended in the E9 report. Occasionally candidates presented a making diary that had no real evidence of them having made the product, but rather images of components in various stages of completion, or it appeared that construction occurred at home, this should be avoided.

Where the work submitted had a client narrative at this stage and the use of tools and equipment had complexity the candidates score well, it is interesting to report that the

moderation team felt that in this series that 'real' products scored well in the manufacturing sections, whereas modelled outcomes struggled to meet the assessment criteria.

The overuse of CAM, which was an issue seems to be lessening as centres seem to understand that the candidates need to show some interrelationship of parts if the product is wholly produced via a CAM output along with real detail in assembly and finish.

It is disappointing to report that we did see some work that was below the standard that we would expect for the Advanced level, but this is diminishing, however we do need to see the use of tools and equipment use that is commensurate with A level.

Where Architectural modelling was undertaken well it did utilise many processes but often it lacked real rigour and so in those cases fared less well.

Grid Ten: Quality and Accuracy.

This section should be characterised by demonstrating high level making skills that evidence accuracy leading to a quality artefact that is fully functioning prototype that meets the end user needs identified in the specification. We should also see candidates not being afraid to consult with the interested parties and amend the design during the manufacturing as a result of this consultation or indeed in response to issues during the manufacturing process, if necessary, therefore evidencing an iterative approach during the process of manufacture.

At the top end of the range excellent making was demonstrated with superb quality and finish. It is pleasing to report that the centre assessment of this criterion was, at the medium to high levels generally accurate. The candidates undertook complex proposals and executed them well, the centre assessment was accurate and broadly agreed, however these candidates did tend to be related to real problems and established clients that had input throughout the process.

We did occasionally see work that was not suitable for A level for example rather simple desk storage boxes or corporate identification products that demonstrated some good designing but little in terms of advanced level skills. Where there were issues it was due to a simplistic starting point such as 'my client has an untidy desk' which resulted in a desk tidy, this could have been made much better in terms of modular desks or small space utilisation.

Candidates should be encouraged to demonstrate a broad range of skills at an advanced level that demonstrates real understanding of the processes to ensure an accurate outcome.

Where the candidates submitted architectural models they were polar opposites often they consisted of poorly scaled models poorly finished whereas in the best cases the products mimicked a return to client model that was a 3 dimensional visual that would/could encourage further iterative triggers that may feed into the testing and evaluation.

In summary we did see some very well made client led products but as has been the case throughout this series candidates have often not adopted an iterative approach to their submissions.

Grid Eleven: Testing and evaluation.

In this section we are looking for the candidate's ability to discern the difference between testing and evaluating. The notion of testing implies putting the product into service and considering its success, especially in terms of the specification and the clients' needs wants and values, whereas in the evaluation phase we are looking for a critical review including strengths and weaknesses which will then give a balanced conclusion supported by all of the analysis undertaken. This could lead to further suggested modifications therefore illustrating a post manufacture iterative approach. The definitions in appendix 5 of Analyse and Evaluate in the specification may help with candidates further understanding.

The use of in-situ testing was, on the increase, and pleasing to see, this certainly enhanced the potential for real evaluative and balanced commentary and improvements.

The main area of concern is that the specification is paramount to success in this criterion, it is impossible for the candidates to evidence successful evaluative commentary if the

specification lacks measurable elements. Candidates have to be able to plan, describe, conduct, evidence, and analyse objective and quantifiable tests as a product of a realistic and measurable specification that has client input so that the overall success of the requirements of the client can be assessed. This then would lead on to further post manufacture modifications which again evidence the iterative approach to the design process.